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(54) **METHOD AND SYSTEM FOR QUICK SQUARE ROOF REPORTING**

(75) Inventors: **Chris T. Thornberry**, Indianapolis, IN (US); **Dale R. Thornberry**, Carmel, IN (US)

(73) Assignee: **Pictometry International Corp.**, Rochester, NY (US)

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Primary Examiner — Matthew Zimmerman
(74) *Attorney, Agent, or Firm* — Dunlap Codding, P.C.

(57) **ABSTRACT**

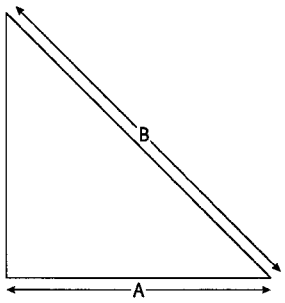
A set of instructions stored on one or more computer readable medium for running on one or more computer systems is described herein. The set of instructions generally may include instructions for identifying a geographic location of a roof, instructions for determining contact information of one or more contractors within a region of interest of the geographic location of the roof, instructions for determining a footprint of the roof, instructions for determining predominant pitch of the roof, and/or instructions for determining an estimated roofing area based on the predominant pitch and the footprint of the roof.

18 Claims, 9 Drawing Sheets

Slope Factor Chart

Pitch of Roof	1:12	2:12	3:12	4:12	5:12	6:12	7:12	8:12	9:12	10:12	11:12	12:12
Slope Factor	1.0035	1.0138	1.0308	1.0541	1.0833	1.1180	1.1577	1.2019	1.2500	1.3017	1.3566	1.4142

(A) x (Slope Factor) = (B)



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Korean Intellectual Property Office, International Search Report and Written Opinion, Mail Date Jul. 10, 2013.

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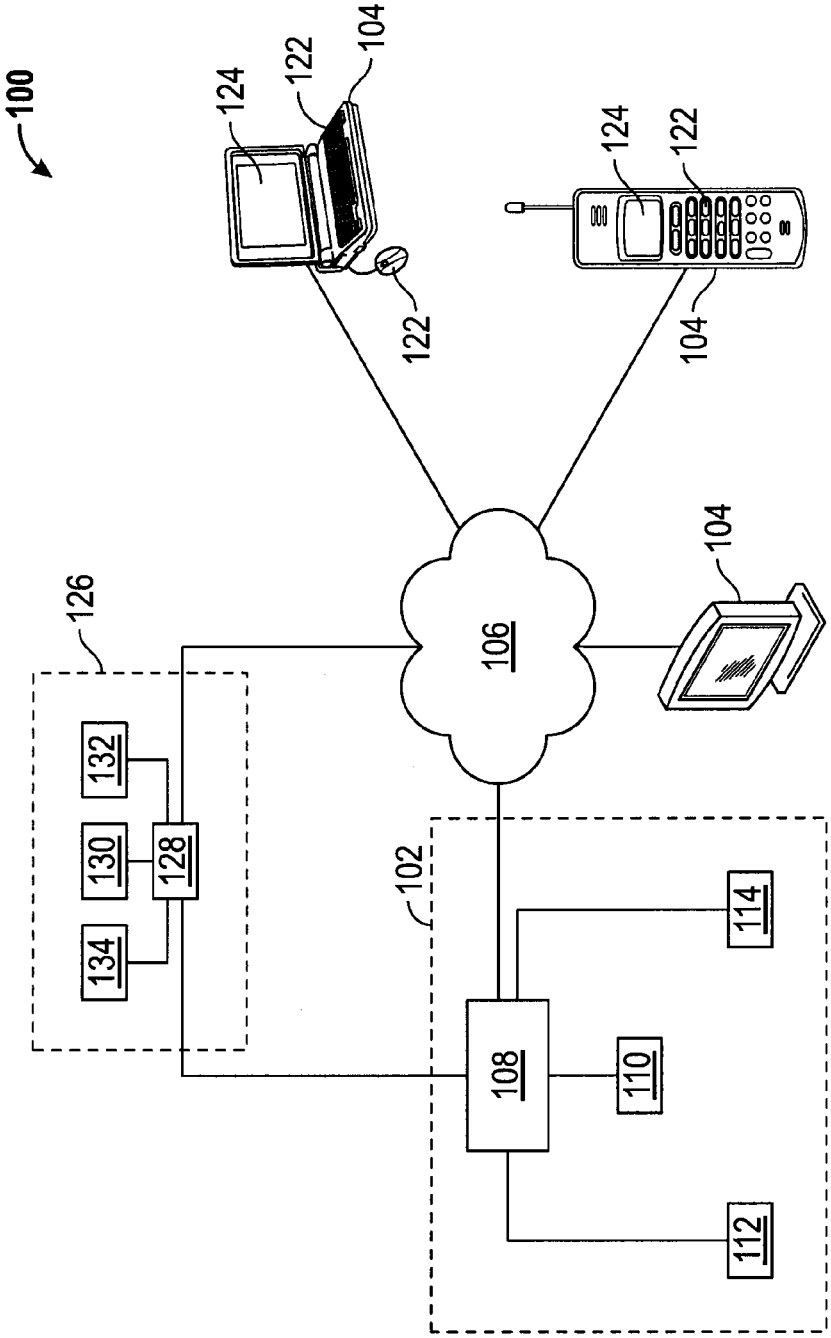

100
124
122
104
124
122
122
104
104
106
126
132
130
134
128
102
114
108
110
112

FIG. 1

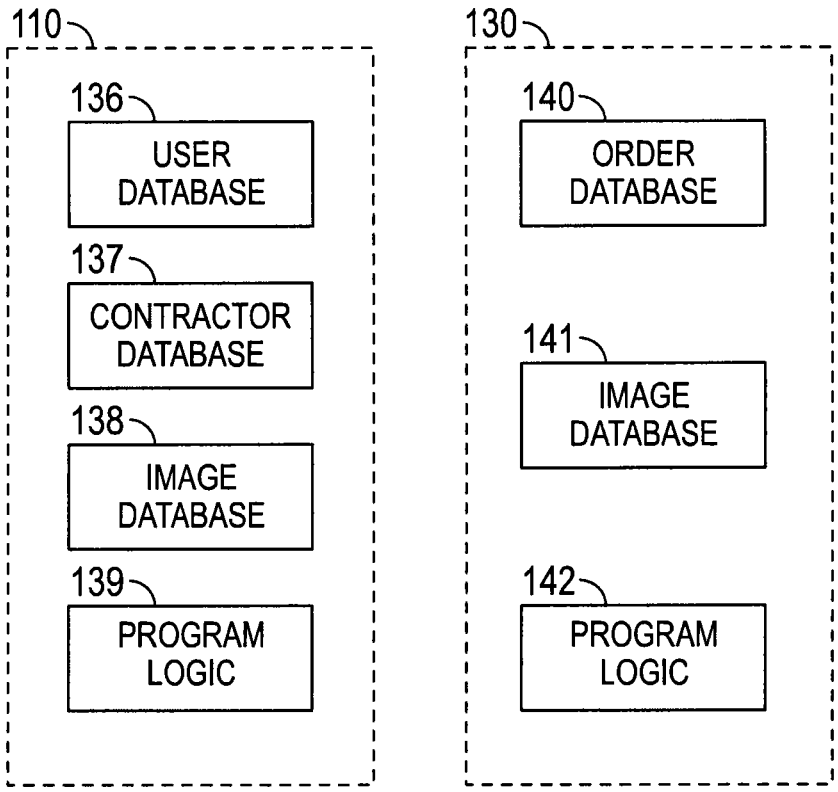

110
136
USER DATABASE
137
CONTRACTOR DATABASE
138
IMAGE DATABASE
139
PROGRAM LOGIC
130
140
ORDER DATABASE
141
IMAGE DATABASE
142
PROGRAM LOGIC

FIG. 2

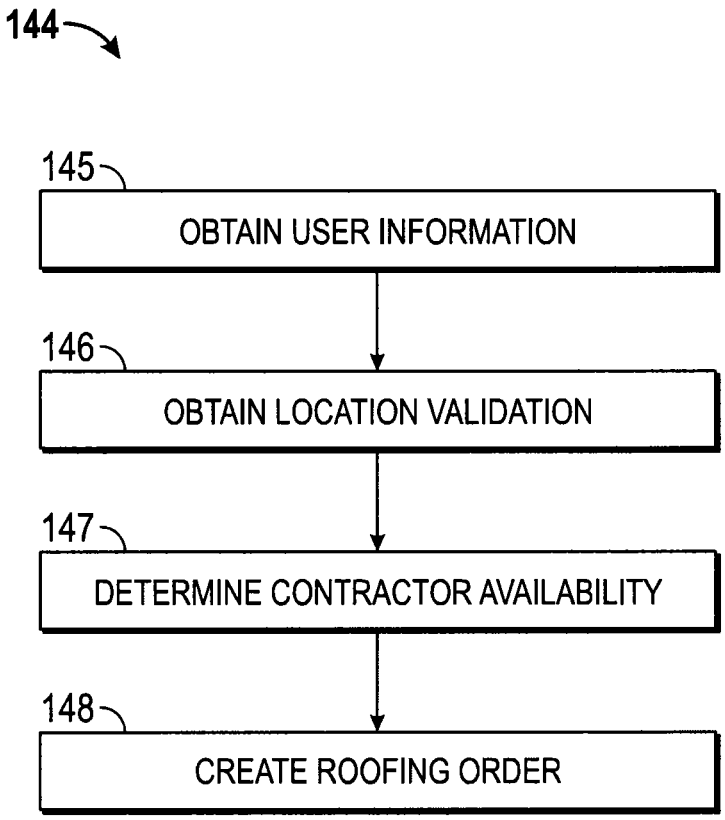

144
145
OBTAIN USER INFORMATION
146
OBTAIN LOCATION VALIDATION
147
DETERMINE CONTRACTOR AVAILABILITY
148
CREATE ROOFING ORDER

FIG. 3

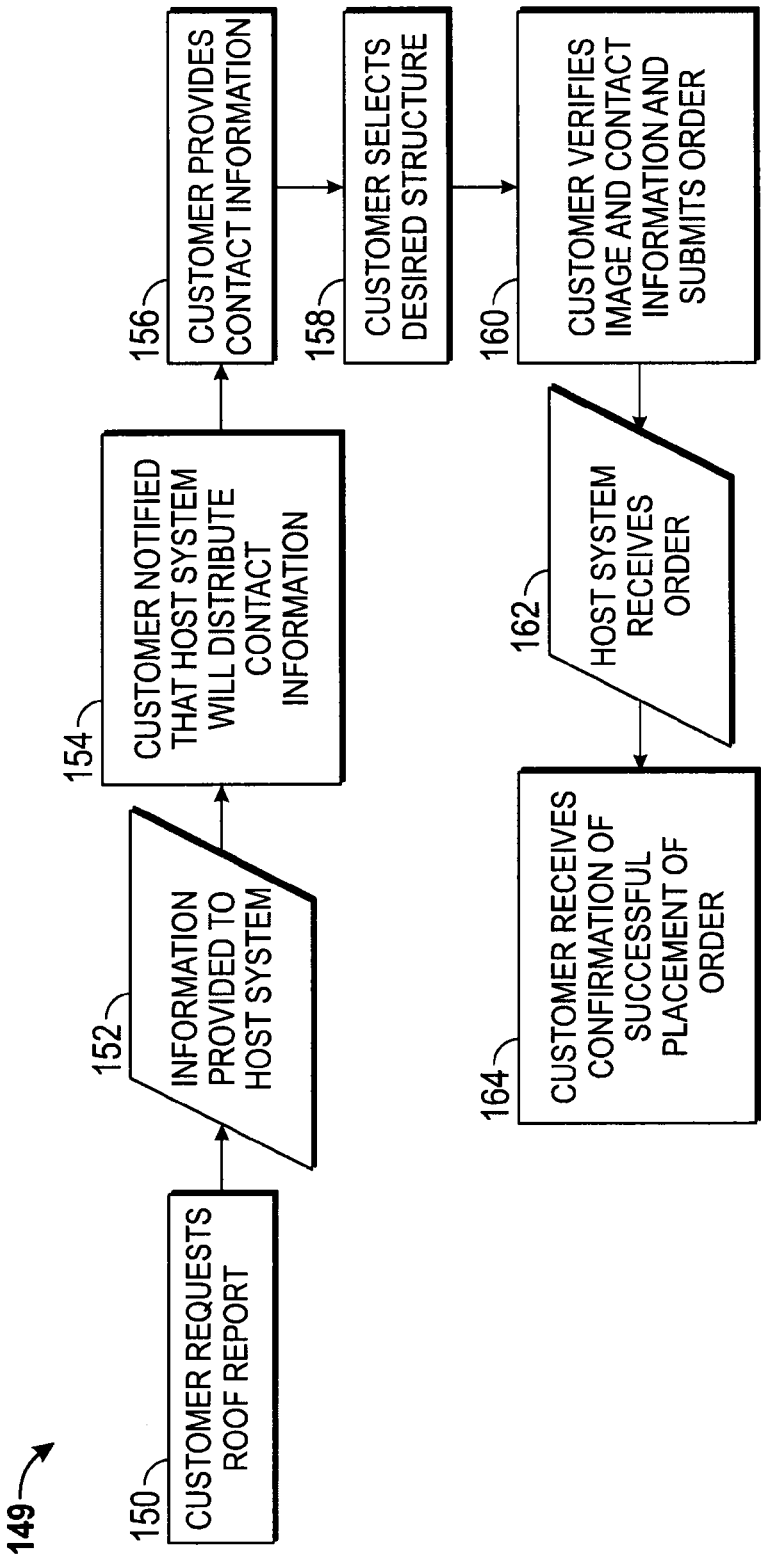

149
150
CUSTOMER REQUESTS ROOF REPORT
152
INFORMATION PROVIDED TO HOST SYSTEM
154
CUSTOMER NOTIFIED THAT HOST SYSTEM WILL DISTRIBUTE CONTACT INFORMATION
156
CUSTOMER PROVIDES CONTACT INFORMATION
158
CUSTOMER SELECTS DESIRED STRUCTURE
160
CUSTOMER VERIFIES IMAGE AND CONTACT INFORMATION AND SUBMITS ORDER
162
HOST SYSTEM RECEIVES ORDER
164
CUSTOMER RECEIVES CONFIRMATION OF SUCCESSFUL PLACEMENT OF ORDER

FIG. 4

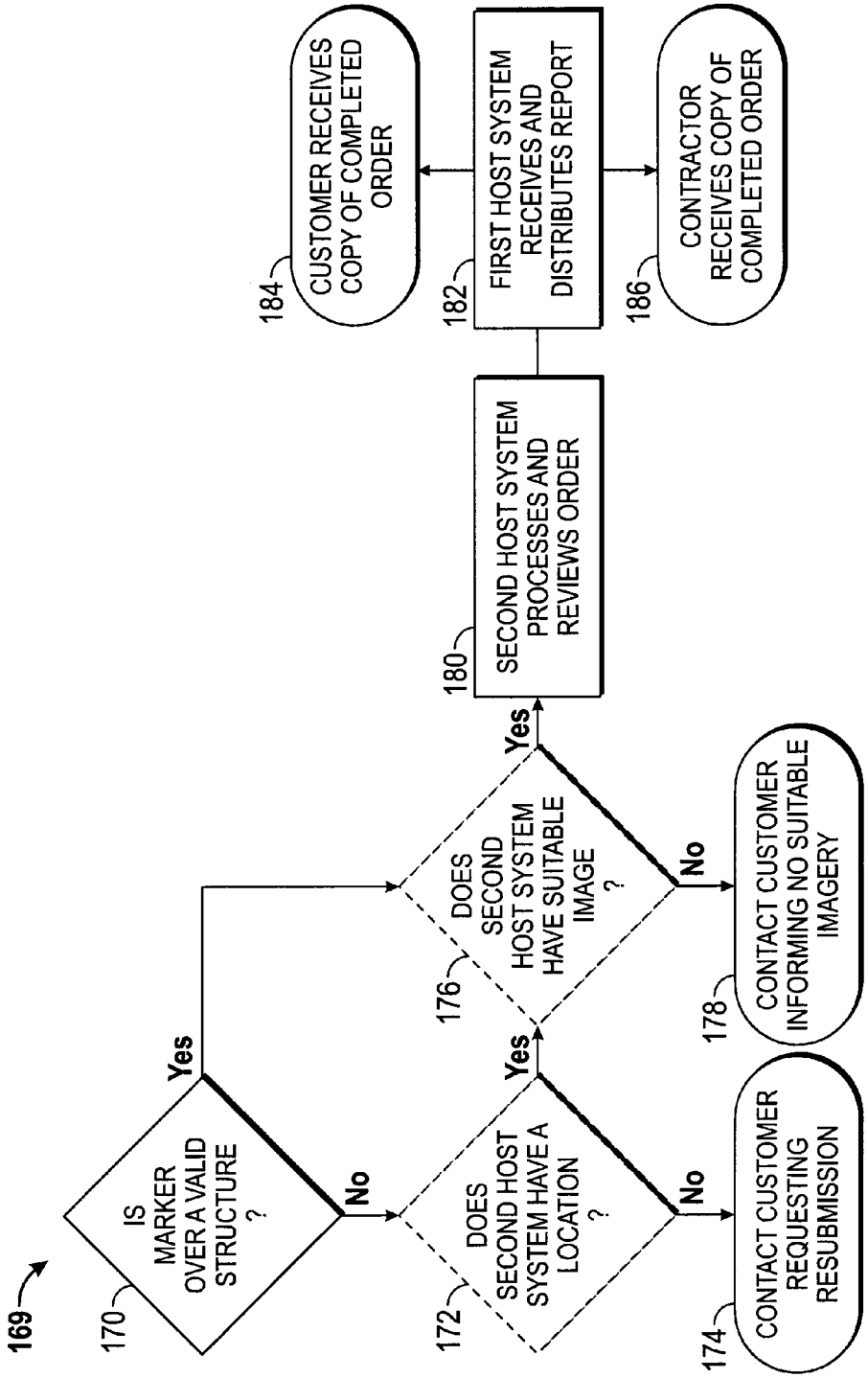

169
170
IS MARKER OVER A VALID STRUCTURE ?
Yes
No
172
DOES SECOND HOST SYSTEM HAVE A LOCATION ?
Yes
No
174
CONTACT CUSTOMER REQUESTING RESUBMISSION
176
DOES SECOND HOST SYSTEM HAVE SUITABLE IMAGE ?
Yes
No
178
CONTACT CUSTOMER INFORMING NO SUITABLE IMAGERY
180
SECOND HOST SYSTEM PROCESSES AND REVIEWS ORDER
182
FIRST HOST SYSTEM RECEIVES AND DISTRIBUTES REPORT
184
CUSTOMER RECEIVES COPY OF COMPLETED ORDER
186
CONTRACTOR RECEIVES COPY OF COMPLETED ORDER

FIG. 5

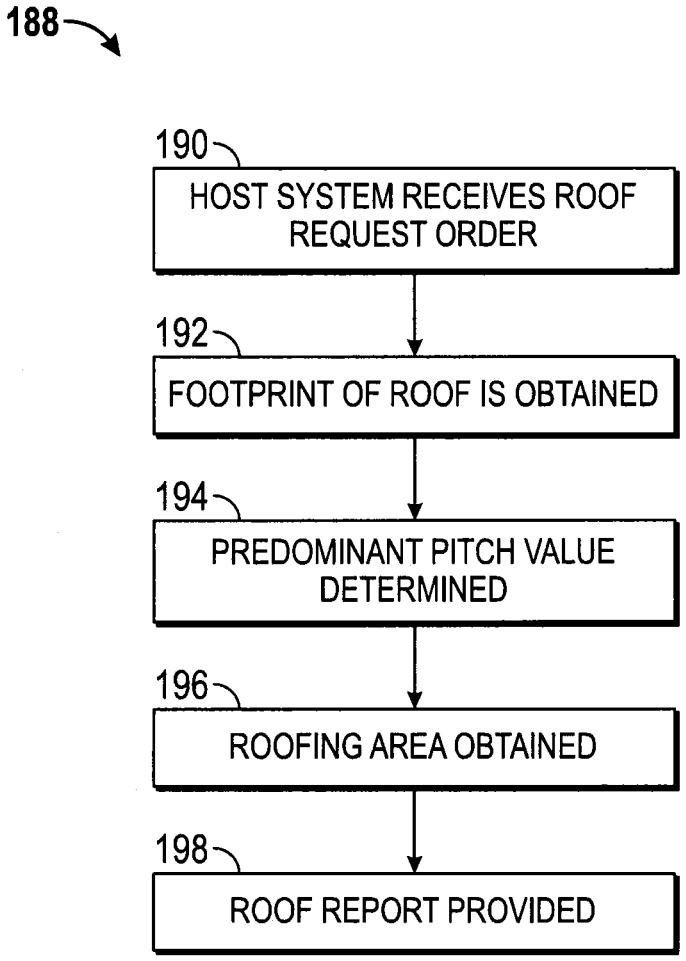

188
190
HOST SYSTEM RECEIVES ROOF REQUEST ORDER
192
FOOTPRINT OF ROOF IS OBTAINED
194
PREDOMINANT PITCH VALUE DETERMINED
196
ROOFING AREA OBTAINED
198
ROOF REPORT PROVIDED

FIG. 6

Slope Factor Chart

Pitch of Roof	1:12	2:12	3:12	4:12	5:12	6:12	7:12	8:12	9:12	10:12	11:12	12:12
Slope Factor	1.0035	1.0138	1.0308	1.0541	1.0833	1.1180	1.1577	1.2019	1.2500	1.3017	1.3566	1.4142

(A) x (Slope Factor) = (B)

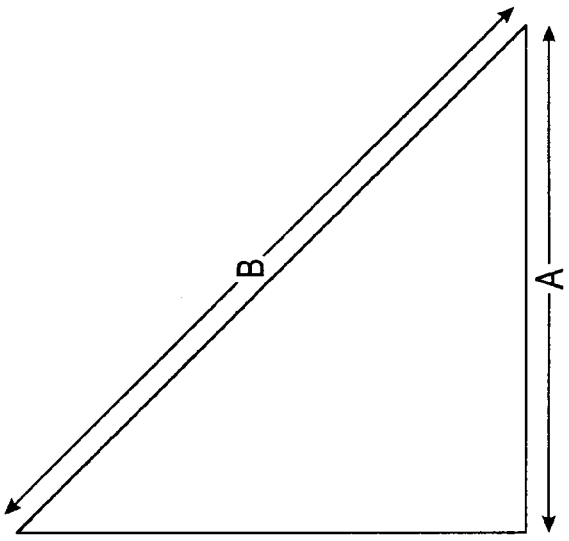
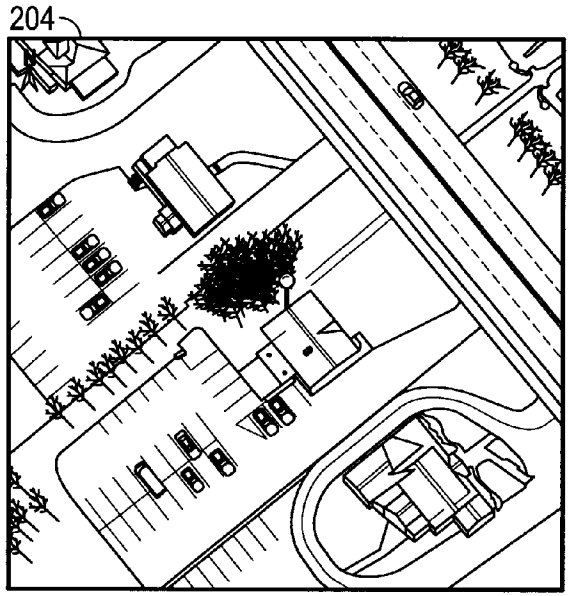


FIG. 7



200

202

John Homeowner
1440 Monroe Ave
Rochester NY, 14618
123-456-7890
homeowner@gaf.com

Congratulations!

You have received a Pictometry Roof Squares Report compliments of GAF. This report provides an estimate of the number of squares on your roof.

REPORT DETAILS : INTRODUCTION

202

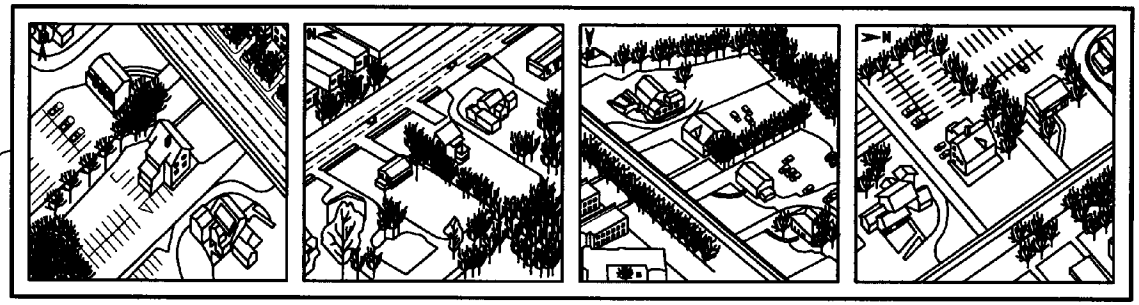
HOMEOWNER

John Homeowner	Order # : PIC-000012840
1440 Monroe Ave	Phone : 123-456-7890
Rochester NY, 14618	Email : homeowner@gaf.com

REPORT BY
GAF
Pictometry formerly GeoEstimator
Find out more: GeoEstimator.com

FIG. 8

GAF



200

204

206 Your roof is estimated at **20.2 squares***+/- 10%

208

A copy of your report is being sent to the following GAF Master Elite Contractors who will be able to provide a quotation for installation services.

Contractor 1
123 Main Street
Anywhere, MY 11735
800Contractor1

Contractor 2
456 Main Street
Anywhere, MY 107470
800Contractor2

*DISCLAIMER: The information contained in this report is for estimating purposes, and should be verified by a roofing professional. Use of this report is subject to terms and conditions found at www.pictometry.com/roof.

REPORT DETAILS : INTRODUCTION

HOMEOWNER

John Homeowner
1440 Monroe Ave
Rochester NY, 14618

Order # : PIC-000012840
Phone : 123-456-7890
Email : homeowner@gaf.com

REPORT BY GAF Pictometry formerly GeoEstimator
Find out more: GeoEstimator.com

Page: 2

FIG. 8 (Continued)

METHOD AND SYSTEM FOR QUICK SQUARE ROOF REPORTING

CROSS-REFERENCE TO RELATED APPLICATIONS

Not Applicable.

BACKGROUND

Residential and/or commercial property owners approaching a major roofing project may be unsure of the amount of material needed and/or the next step in completing the project. Generally, such owners contact one or more contractors for a site visit. Each contractor must physically be present at the site of the structure in order to make a determination on material needs and/or time. The time and energy for providing such an estimate becomes laborious and may be affected by contractor timing, weather, contractor education, and the like. Estimates may be varied even between contractors in determination of estimated square footage causing variance in supply ordering as well. Additionally, measuring an actual roof may be costly and potentially hazardous—especially with steeply pitched roofs. Completion of a proposed roofing project may depend on ease in obtaining a simplified roofing estimate and/or obtaining reputable contractors for the roofing project.

Images are currently being used to measure objects and structures within the images, as well as to be able to determine geographic locations of points within the image when preparing estimates for a variety of construction projects, such as roadwork, concrete work, and roofing. Estimating construction projects using software may increase speed at which an estimate can be prepared, and may reduce labor and fuel costs associated with on-site visits.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

Like reference numerals in the figures represent and refer to the same or similar element or function. Implementations of the disclosure may be better understood when consideration is given to the following detailed description thereof. Such description makes reference to the annexed pictorial illustrations, schematics, graphs, drawings, and appendices. In the drawings:

FIG. **1** is a schematic diagram of an embodiment of a roof estimator reporting system according to the instant disclosure.

FIG. **2** is a block diagram of an embodiment of one or more memory according to the instant disclosure.

FIG. **3** is an exemplary embodiment of a program logic according to the instant disclosure.

FIG. **4** is another exemplary embodiment of a program logic according to the instant disclosure.

FIG. **5** is yet another exemplary embodiment of a program logic according to the instant disclosure.

FIG. **6** is a further exemplary embodiment of a program logic according to the instant disclosure.

FIG. **7** is an exemplary slope factor chart for determining pitch factors according to the instant disclosure.

FIG. **8** is an exemplary embodiment of a roofing report presentation page according to the instant disclosure.

DETAILED DESCRIPTION OF INVENTIVE CONCEPT

Before explaining at least one embodiment of the inventive concept disclosed herein in detail, it is to be understood that the inventive concept is not limited in its application to the details of construction and the arrangement of the components or steps or methodologies set forth in the following description or illustrated in the drawings. The inventive concept disclosed herein is capable of other embodiments or of being practiced or carried out in various ways. Also, it is to be understood that the phraseology and terminology employed herein is for the purpose of description and should not be regarded as limiting in any way.

In the following detailed description of embodiments of the inventive concept, numerous specific details are set forth in order to provide a more thorough understanding of the inventive concept. It will be apparent to one of ordinary skill in the art, however, that the inventive concept within the disclosure may be practiced without these specific details. In other instances, well-known features have not been described in detail to avoid unnecessarily complicating the instant disclosure.

Referring now to the drawings, and in particular to FIG. **1**, shown therein and designated by a reference numeral **100** is an exemplary computer system **100** constructed in accordance with the present disclosure. The system **100** can be a system or systems that are able to embody and/or execute the logic of the processes described herein. The logic embodied in the form of software instructions, or firmware may be executed on any appropriate hardware which may be a dedicated system or systems.

As used herein, the terms "network-based", "cloud-based" and any variations thereof, are intended to include the provision of configurable computational resources on demand via interfacing with a computer and/or computer network, with software and/or data at least partially located on the computer and/or computer network, by pooling processing power of two or more networked processors.

As used herein, the terms "comprises", "comprising", "includes", "including", "has", "having", or any other variation thereof, are intended to be non-exclusive inclusions. For example, a process, method, article, or apparatus that comprises a set of elements is not limited to only those elements but may include other elements not expressly listed or even inherent to such process, method, article, or apparatus.

As used in the instant disclosure, the terms "provide", "providing", and variations thereof comprise displaying or providing for display a webpage (e.g., roofing webpage) to one or more user terminals interfacing with a computer and/or computer network(s) and/or allowing the one or more user terminal(s) to participate, such as by interacting with one or more mechanisms on a webpage (e.g., roofing webpage) by sending and/or receiving signals (e.g., digital, optical, and/or the like) via a computer network interface (e.g., Ethernet port, TCP/IP port, optical port, cable modem, and combinations thereof). A user may be provided with a web page in a web browser, or in a software application, for example.

As used herein, the term "roof request", "roofing request", "roofing order", and any variations thereof may comprise a feature of the graphical user interface or a feature of a software application, allowing a user to indicate to a host system that the user wishes to place an order, such as by interfacing with the host system over a computer network and exchanging signals (e.g., digital, optical, and/or the like), with the host system using a network protocol, for example. Such mechanism may be implemented with computer executable code executed by one or more processors, for example, with a button, a hyperlink, an icon, a clickable symbol, and/or combinations thereof, that may be activated by a user terminal interfacing with the at least one processor over a computer network, for example.

Further, unless expressly stated to the contrary, "or" refers to an inclusive or and not to an exclusive or. For example, a condition A or B is satisfied by anyone of the following: A is true (or present) and B is false (or not present), A is false (or not present) and B is true (or present), and both A and B are true (or present).

In addition, the use of the "a" or "an" are employed to describe elements and components of the embodiments herein. This is done merely for convenience and to give a general sense of the inventive concept. This description should be read to include one or more, and the singular also includes the plural unless it is obvious that it is meant otherwise.

Finally, as used herein any reference to "one embodiment" or "an embodiment" means that a particular element, feature, structure, or characteristic described in connection with the embodiment is included in at least one embodiment. The appearance of the phrase "in one embodiment" in various places in the specification are not necessarily all referring to the same embodiment.

Referring now to FIG. **1**, shown therein is an exemplary embodiment of a roof estimator reporting system **100** according to the instant disclosure. The system **100** comprises two or more host systems **102** and **126** interfacing and/or communicating with one or more user terminals **104** via a network **106**.

The one or more user terminals **104** may be implemented as a personal computer, a smart phone, network-capable TV set, TV set-top box, a tablet, an e-book reader, a laptop computer, a desktop computer, a network-capable handheld device, a video game console, a server, a digital video recorder, a DVD-player, a Blu-Ray player and combinations thereof, for example. In an exemplary embodiment, the user terminal **104** may comprise an input device **122**, an output device **124**, a processor (not shown) capable of interfacing with the network **106**, processor executable code (not shown), and a web browser capable of accessing a website and/or communicating information and/or data over a network, such as the network **106**. As will be understood by persons of ordinary skill in the art, the one or more user terminals **104** may comprise one or more non-transient memories comprising processor executable code and/or software applications, for example.

The input device **122** may be capable of receiving information input from a user and/or other processor(s), and transmitting such information to the user terminal **104** and/or to the host system **102**. The input device **122** may be implemented as a keyboard, a touchscreen, a mouse, a trackball, a microphone, a fingerprint reader, an infrared port, a slide-out keyboard, a flip-out keyboard, a cell phone, a PDA, a video game controller, a remote control, a fax machine, a network interface, and combinations thereof, for example.

The output device **124** may output information in a form perceivable by a user and/or other processor(s). For example, the output device **124** may be a server, a computer monitor, a screen, a touchscreen, a speaker, a website, a TV set, a smart phone, a PDA, a cell phone, a fax machine, a printer, a laptop computer, and combinations thereof. It is to be understood that in some exemplary embodiments, the input device **122** and the output device **124** may be implemented as a single device, such as, for example, a touchscreen or a tablet. It is to be further understood that as used herein the term user is not limited to a human being, and may comprise a computer, a server, a website, a processor, a network interface, a human, a user terminal, a virtual computer, and combinations thereof, for example.

The system **100** may include one or more host systems. For example, FIG. **1** illustrates system **100** having two host systems **102** and **126**. The host systems **102** and **126** may be partially or completely network-based or cloud based, and not necessarily located in a single physical location. Each of the host systems **102** and **126** may further be capable of interfacing and/or communicating with the one or more user terminals **104** via the network **106**, such as by exchanging signals (e.g., digital, optical, and/or the like) via one or more ports (e.g., physical or virtual) using a network protocol, for example. Additionally, each host system **102** and **126** may be capable of interfacing and/or communicating with other host systems directly and/or via the network **106**, such as by exchanging signals (e.g., digital, optical, and/or the like) via one or more ports.

In some embodiments, host systems **102** and **126** may be independently controlled by separate entities. Host system **102** may be controlled by a first company and host system **126** may be controlled by a second company distinct from the first company. For example, host system **102** may be controlled by a roofing material supplier and host system **126** may be controlled by a roofing report company. The roofing material supplier may be a separate entity from the roofing report company.

The host system **102** may be referred to hereinafter as the "first host system" and the host system **126** may be referred to hereinafter as the "second host system". The first host system **102** may comprise one or more processors **108** working together, or independently to, execute processor executable code, one or more memories **110** capable of storing processor executable code, one or more input devices **112**, and one or more output devices **114**. Each element of the first host system **102** may be partially or completely network-based or cloud-based, and not necessarily located in a single physical location.

The one or more processors **108** may be implemented as a single or plurality of processors **108** working together, or independently to execute the logic as described herein. Exemplary embodiments of the one or more processors **108** include a digital signal processor (DSP), a central processing unit (CPU), a field programmable gate array (FPGA), a microprocessor, a multi-core processor, and/or combinations thereof. The one or more processors **108** may be capable of communicating with the one or more memories **110** via a path (e.g., data bus). The one or more processors **108** may be capable of communicating with the input devices **112** and the output devices **114**.

The one or more processors **108** may be further capable of interfacing and/or communicating with the one or more user terminals **104** via the network **106**. For example, the one or more processors **108** may be capable of communicating via the network **106** by exchanging signals (e.g., digital, optical, and/or the like) via one or more physical or virtual ports using a network protocol. It is to be understood that in certain embodiments using more than one processor **108**, the one or more processors **108** may be located remotely from one another, located in the same location, or comprising a unitary multi-core processor (not shown). The one or more processors **108** may be capable of reading and/or executing processor executable code and/or of creating, manipulating, altering, and/or storing computer data structures into one or more memories **110**.

The one or more memories **110** may be capable of storing processor executable code. Additionally, the one or more memories **110** may be implemented as a conventional non-transient memory **110**, such as, for example, random access memory (RAM), a CD-ROM, a hard drive, a solid state drive, a flash drive, a memory card, a DVD-ROM, a floppy disk, an optical drive, and/or combinations thereof. It is to be understood that while one or more memories **110** may be located in

the same physical location as the first host system **102**, the one or more memories **110** may be located remotely from the first host system **102**, and may communicate with the one or more processor **108** via the network **106**. Additionally, when more than one memory **110** is used, a first memory **110** may be located in the same physical location as the first host system **102**, and additional memories **110** may be located in a remote physical location from the first host system **102**. The physical location(s) of the one or more memories **110** may be varied. Additionally, one or more memories **110** may be implemented as a "cloud memory" (i.e., one or more memory **110** may be partially or completely based on or accessed using the network **106**).

The one or more input devices **112** may transmit data to the processors **108**, and may be implemented as a keyboard, a mouse, a touchscreen, a camera, a cellular phone, a tablet, a smart phone, a PDA, a microphone, a network adapter, and/or combinations thereof. The input devices **112** may be located in the same physical location as the first host system **102**, or may be remotely located and/or partially or completely network-based.

The one or more output devices **114** may transmit information from the processor **108** to a user, such that the information may be perceived by the user. For example, the output devices **114** may be implemented as a server, a computer monitor, a cell phone, a tablet, a speaker, a website, a PDA, a fax, a printer, a projector, a laptop monitor, and/or combinations thereof. The output device **114** may be physically co-located with the first host system **102**, or may be located remotely from the first host system **102**, and may be partially or completely network based (e.g., website). As used herein, the term "user" is not limited to a human, and may comprise a human, a computer, a host system, a smart phone, a tablet, and/or combinations thereof, for example.

The first host system **102** may directly communicate with the second host system **126** and/or communicate via network **106**. Generally, the first host system **102** may include one or more processors **108** capable of executing a first set of processor executable code and the second host system **126** may include one or more processors **128** capable of executing a second set of processor executable code.

The second host system **126** may further comprise one or more memories **130** capable of storing processor executable code, one or more input devices **132**, and one or more output devices **134**. Each element of the second host system **126** may be partially or completely network-based or cloud based, and not necessarily located in a single physical location.

The one or more processors **128** may be implemented as a single or a plurality of processors **128** working together to execute the logic described herein. Exemplary embodiments of the one or more processors **128** include a digital signal processor (DSP), a central processing unit (CPU), a field programmable gate array (FPGA), a microprocessor, a multi-core processor, and/or combinations thereof. The one or more processors **128** may be capable of communicating with the one or more memories **130** via a path (e.g., data bus). The one or more processors **128** may be capable of communicating with the input devices **132** and the output devices **134**.

The one or more processors **128** may be further capable of interfacing and/or communicating with the one or more user terminals **104** via the network **106**. For example, the one or more processors **128** may be capable of communicating via the network **106** by exchanging signals (e.g., digital, optical, and/or the like) via one or more physical or virtual ports using a network protocol. It is to be understood that in certain embodiments using more than one processor **128**, the one or more processors **128** may be located remotely from one another, located in the same location, or comprising a unitary multi-core processor (not shown). The one or more processors **128** may be capable of reading and/or executing processor executable code and/or of creating, manipulating, altering, and/or storing computer data structures into one or more memories **130**.

The one or more memories **130** may be capable of storing processor executable code. Additionally, the one or more memories **130** may be implemented as a conventional non-transient memory **130**, such as, for example, random access memory (RAM), a CD-ROM, a hard drive, a solid state drive, a flash drive, a memory card, a DVD-ROM, a floppy disk, an optical drive, and/or combinations thereof. It is to be understood that while one or more memories **130** may be located in the same physical location as the second host system **126**, the one or more memories **130** may be located remotely from the second host system **126**, and may communicate with the one or more processor **128** via the network **106**. Additionally, when more than one memory **130** is used, a first memory **130** may be located in the same physical location as the second host system **126**, and additional memories **130** may be located in a remote physical location from the second host system **126**. The physical location(s) of the one or more memories **130** may be varied. Additionally, one or more memories **130** may be implemented as a "cloud memory" (i.e., one or more memory **130** may be partially or completely based on or accessed using the network **106**).

The input devices **132** may transmit data to the processors **128**, and may be implemented as a keyboard, a mouse, a touchscreen, a camera, a cellular phone, a tablet, a smart phone, a PDA, a microphone, a network adapter, and/or combinations thereof. The input devices **132** may be located in the same physical location as the second host system **126**, or may be remotely located and/or partially or completely network-based.

The output devices **134** may transmit information from the processors **128** to a user, such that the information may be perceived by the user. For example, the output devices **134** may be implemented as a server, a computer monitor, a cell phone, a tablet, a speaker, a website, a PDA, a fax, a printer, a projector, a laptop monitor, and/or combinations thereof. The output devices **134** may be physically co-located with the second host system **126**, or may be located remotely from the second host system **126**, and may be partially or completely network based (e.g., website).

The network **106** may permit bi-directional communication of information and/or data between the first host system **102**, the second host system **126** and/or user terminals **104**. The network **106** may interface with the first host system **102**, the second host system **126**, and the user terminals **104** in a variety of ways. For example, the network **106** may interface by optical and/or electronic interfaces, and/or may use a plurality of network topographies and/or protocols including, but not limited to, Ethernet, TCP/IP, circuit switched paths, and/or combinations thereof. For example, the network **106** may be implemented as the World Wide Web (or Internet), a local area network (LAN), a wide area network (WAN), a metropolitan network, a wireless network, a cellular network, a GSM-network, a CDMA network, a 3G network, a 4G network, a satellite network, a radio network, an optical network, a cable network, a public switched telephone network, an Ethernet network, and/or combinations thereof. Additionally, the network **106** may use a variety of network protocols to permit bi-directional interface and/or communication of data and/or information between the first host system **102**, the second host system **126**, and/or one or more user terminals **104**.

Referring to FIGS. **1** and **2**, the one or more memories **110** may store processor executable code and/or information comprising a user database **136**, a contractor database **137**, a first image database **138** and program logic **139**. The processor executable code may be stored as a data structure, such as a database and/or a data table, for example.

The user database **136** may include information about customers engaging with the first host system **102**. For example, one or more customers may access the first host system **102** through the one or more user terminals **104**. The first host system **102** may provide a roof request website to the user terminal **104**. The roof request website may be directed by the one or more processors **108**. The processor **108** may also direct the one or more customers to a login/registration portion of the website.

In some embodiments, customers may register a user profile with the first host system **102**. The user profile may be created and/or stored in the user database **136** by the processor **108**. For example, the customer may be prompted by the processor **108** to provide login credentials (e.g., username and/or password). Login credentials may allow the processor **108** to authenticate the customer against the user database **136**. In this manner, the first host system **102** may access the user profile in the user database **136**. The user profile may include information including, but not limited to, demographic information including, but not limited to, name, age, address, billing account information, username, password, behavioral information, experience, gender, and/or the like.

If user authentication is successful, the user profile may be accessed by the processor **108**. If the user authentication fails, the customer may be returned to the login/registration page, where the customer may be prompted for a username and password again. Optionally, the processor **108** may block a customer from entering a username and/or password after a preset number of failed authentication attempts.

In some embodiments, customers may be prompted by the processor **108** to provide information for a user profile without registration and/or authentication using a username and/or password. The user profile may be created and/or stored in the user database **136** by the processor **108**. For example, the processor **108** may prompt the customer to provide demographic information (e.g., name, address, billing account information, and the like), and store the information in a user profile for the customer using a unique customer identification.

The contractor database **137** may comprise information about roofing contractors within a given geographic location. Each roofing contractor may be associated with a contractor profile having information including, but not limited to, roofing contractor business name, roofing contractor owner name, address, experience level, age of contractor business, review information, and the like. In some embodiments, the contractor profile may include a geographical category assignment identification (ID). For example, the contractor profile may be assigned a numerical or alphabetical identification based on geographic location of the business.

In some embodiments, the contractor profile may include review information. The review information may include positive and/or negative feedback relating to each contractor. For example, the review information may be based on prior customer feedback of customers using the system **100**. Review information may also be obtained from one or more outside databases (e.g., Yelp, Google review, and/or the like).

One or more contractors may provide a contractor profile via the first host system **102**. For example, one or more contractors may access the roof review website of the first host system **102** via the user terminal **104**. The processor **108** may direct the contractor via the roof review website to a login/registration portion of the website. If the contractor has previously registered with the first host system **102**, the contractor may be prompted by the processor **108** to provide login credentials (e.g., username and/or password), which may allow the processor **108** to authenticate the contractor against the contractor database **137**.

If the contractor is not registered with the first host system **102**, the first host system **102** may prompt the contractor to provide information via the one or more user terminals **104** to create a contractor profile. Alternatively, the contractor profiles may be provided in the contractor database **137** without information provided by each contractor. For example, a user of the first host system **102** may provide information via the input device **112**, the network **106**, and/or the like, setting up a contractor profile without direct knowledge of the contractor.

The one or more memories **110** may include the image database **138**. The image database **138** may store geo-referenced imagery. Such imagery may be represented by a single pixel map, and/or by a series of tiled pixel maps that when aggregated recreate the image pixel map. Imagery may include nadir, ortho-rectified and/or oblique geo-referenced images. The one or more processors **108** may provide the images via the image database **138** to customers at the one or more user terminals **104**. Customers, using the user terminals **104**, may provide geographic location information associated with a roof request using the geo-referenced images provided by the one or more processors **108**. For example, a customer may be provided a geo-referenced image to validate the location of a structure (e.g., roof). In some embodiments, the customer may be able to select the structure (e.g., via a drag-and-drop user interface) to pinpoint a location of the structure within the image. Selection of the structure may provide location information (e.g., latitude/longitude coordinate, or and the like) of the structure to the first host system **102**. For simplicity, the description will provide for a roof as the structure of interest. However, is should be apparent that other structures of buildings and/or landscapes may be used in accordance with the present disclosure.

The one or more memories **110** may further store processor executable code and/or instructions, which may comprise the program logic **139**. The program logic **139** may comprise processor executable instructions and/or code, which when executed by the processor **108**, may cause the processor **108** to generate, maintain, provide, and/or host a website providing one or more roofing requests, for example. The program logic **139** may further cause the processor **108** to collect user information and/or contractor information, create user profiles and/or contractor profiles, provide users one or more geo-referenced images, and allow one or more users to validate a location of the roof as described herein.

The one or more processors **108** may generate, maintain, or provide one or more roofing orders to the second host system **126**. For example, the one or more processors **108** may provide the one or more roofing orders to the second host system **126** by copying information obtained and/or stored in one or more memories **110**. The roofing orders may include contractor profile, user profile, user validated images, a unique ordering ID, and/or the like.

The one or more memories **130** of the second host system **126** may store processor executable code and/or information comprising an order database **140**, a second image database **141** and the program logic **142**. The processor executable code may be stored as a data structure, such as a database and/or a data table, for example.

The order database **140** may include information about a roofing order placed by a customer and copied by the first host system **102**. For example, a roofing order may include contractor profile, user profile, user validated images, a unique ordering ID, and/or the like. The second host system **126** may access the order database **140** to provide a roofing report as described in detail herein.

The one or more memories **130** of the second host system **126** may also include a second image database **141**. The second image database **141** may provide additional nadir, ortho-rectified, and/or oblique geo-referenced and/or non-geo-referenced images for use in providing a roofing report as described in detail herein. Alternatively, the image database **138** and the image database **141** may be the same database.

The one or more memories **130** of the second host system **126** may further store processor executable code and/or instructions, which may comprise program logic **142**. The program logic **142** may comprise processor executable instructions and/or code, which when executed by the one or more processors **128**, may cause the one or more processors **128** to generate, maintain, and/or provide a website or series of websites for providing roofing reports. The program logic **142** may further cause the one or more processors **128** to allow one or more users to participate in executing a roofing report via the input devices **132**.

Referring to FIG. **3**, shown therein is an exemplary flow chart **144** of program logic **139** for creating a roof report order which may be used with the first host system **102** according to the instant disclosure. Program logic **139** may comprise executable code, which when executed by the one or more processors **108** may cause the one or more processors **108** to execute one or more of the following:

The program logic **139** may provide for one or more user terminals **104** interfacing with the processor **108** over the network **106** to provide one or more roofing request website pages allowing customers to place a roofing request order. Each order is generally a request of the customer to provide estimated square footage of a specific roof. Additionally, each order may also include a request for contractor information and/or a bid request for estimate costs and associated features of materials, supplies, physical labor, and the like.

Generally, in a step **145**, customers using one or more user terminals **104** may provide user information to the first host system **102**. The user information may then be used to prepare one or more user profiles for use in preparing the roofing report. Additionally, program logic **139** may generate a unique identification number and/or alpha numeric character to associate with the user profile.

The user information may include a location of the roof provided by the customer. For example, the customer may provide a residential and/or commercial address of the roof. One or more processors **108** may direct customers to validate the location of the roof using user terminals **104**, in step **146**. For example, processors **108** may provide one or more images via the image database **138**. The images may be geo-referenced images illustrating portions or all of the roof. The program logic **139** may cause the processor **108** to provide users the one or more geo-referenced images, and allow the customer to validate the location of the roof. For example, the customer may be able to use a drag-and-drop element provided by the program logic **139** via user terminal **104** to select the roof within the one or more geo-referenced images. Selection of the roof within the one or more geo-referenced images may provide one or more validated images and a validated location of the roof. In some embodiments, the geographic location may include coordinates, and validation of the geographic location may be provided by a customer by altering one or more coordinates of the geographic location. Customers may alter the one or more coordinates by methods including, but not limited to, manual manipulation, drag-and-drop elements, and the like.

It should be understood that validation of the geo-referenced images may be provided by the second host system **126** via the one or more processors **128** in lieu of, or in combination with host system **102**. For example, the first host system **102** may direct customers to the second host system **126** wherein the one or more processors **128** of the second host system **126** provide geo-referenced images from image database **141** to the customer for validation of one or more roof and/or roofing structures. As such, in some embodiments, only the second host system **126** provides geo-referenced images in the image database **141**.

The first host system **102** may determine contractor availability within a region of interest about the validated location of the roof as shown in step **147**. For example, program logic **139** may extract the validated location and compare the validated location against location of contractors in a region of interest. The region of interest may be determined by the customer via user terminal and/or the region of interest may be a pre-programmed determination. For example, the region of interest may be a five mile radius about the validated location. Contractor availability may include contractors having a contractor profile within the contractor database **137**. Contractors within the contractor database **137** may be provided with a copy of the roofing report as described herein.

The program logic **139** may direct the one or more processors **108** to create and/or store a roofing order for the customer as shown in step **148**. Additionally, the program logic **139** may direct one or more processors to transfer the roofing order to the second host system **126**.

FIG. **4** illustrates a flow chart **149** of an exemplary embodiment of the program logic **139** and/or **142** for processing a roof report order which may be used with the system **100** according to the instant disclosure. The program logic **139** comprises processor executable code, that when executed by the processor **108**, may cause the processor **108** to execute one or more of the following:

The program logic **139** may include a step **150** wherein one or more user terminals **104** interfacing with the processor **108** over the network **106** may be provided with one or more websites having a mechanism allowing a customer to request a roof report. The customer may provide the request to the first host system **102** using the one or more websites, in a step **152**. Prior to providing customer information, the customer may be notified that the first host system **102** may distribute any contact information provided by the customer to contractors provided within the first host system **102**. The one or more processors **108** may provide the customer an option for agreeing to terms of service (e.g., distribution of their contact information), in a step **154**.

In a step **156**, the roof report request website may include queries regarding customer information including, but not limited to, customer name, address, address of the roof, billing information, and the like. The customer information may be provided by the one or more processors **108** and stored in the one or more memories **110**. For example, the customer information may be provided by processors **108** as a user profile and stored in the user database **136** of the one or more memories **110**.

Customers may be able to select the desired roof, location, and/or the like on the one or more websites provided by the processor **108** over the network **106**, in step **158**. For example, the customer may use the one or more user terminals **104** to provide a geographical location (e.g., address, latitude/longi-

tude coordinates, or the like), a geo-referenced image, and/or an element within a geo-referenced image. Once the geographical location of the roof is selected, the processor **108** may provide a verification web page or similar mechanism for customer review and/or approval of a proposed order, in a step **160**. The first host system **102** may receive the proposed order via the processor **108**, store the order and/or transfer the order to the second host system **126** for processing, in a step **162**. The processor **108** may provide a confirmation webpage or similar mechanism informing the customer of a successful order placement, in a step **164**.

FIG. **5** illustrates a flow chart **169** of an exemplary embodiment of the program logic **139** and/or **142** for providing a roof report which may be used with the system **100** according to the instant disclosure. Generally, processing of the proposed order may be provided using the second host system **126**. The program logic **142** comprises processor executable code, that when executed by the processor **128**, may cause the processor **128** to execute one or more of the following:

The second host system **126** may receive the proposed order via the one or more processors **108** of the first host system **102**. Generally, the validity of the location of the roof provided by the customer may be determined, in a step **170**. In a step **172**, the second host system **126** may determine if the location of the roof provided by the customer exists. If the location is not found, the customer may be further contacted by the second host system **126** and/or the first host system **102** requesting resubmission or additional information for the proposed order, in a step **174**. Additionally, in a step **176**, the second host system **126** may determine if corresponding imagery within image database **141** exists for the location provided by the customer. If there is no corresponding imagery, the customer may be further contacted by the second host system **126** and/or the first host system **102** with a status message indicating no suitable imagery of the roof currently exists, in a step **178**.

The second host system **126** may further process and review the order, in a step **180**. An exemplary series of steps for implementing step **180** is shown in a flow chart **188** illustrated in FIG. **6**. For example, the one or more processors **128** of the second host system **126** may receive the proposed order, in a step **190**. The one or more processors **128** may extract order related information and images. Generally, a user may access a roof report website provided by the one or more processors **128** to review and/or process the proposed order. For example, the user may access the roof report website using the input devices **132** and the output devices **134** to review and/or process the proposed order.

In some embodiments, using the input devices **132** and/or the output devices **134**, the user may provide additional details to the proposed order regarding the roof including, but not limited to, identification of areas of the roof (e.g., eaves, drip edges, ridges, and the like), pitch, distance, angle, and/or the like.

The footprint of the roof may be determined, in step **192**. For example, the footprint of the roof may be determined using systems and methods including, but not limited to, those described in U.S. Patent Publication No. 2010/0179787, U.S. Patent Publication No. 2010/0110074, U.S. Patent Publication No. 2010/0114537, U.S. Patent Publication No. 2011/0187713, U.S. Pat. No. 8,078,436, and U.S. Ser. No. 12/909,692, all of which are incorporated by reference herein in their entirety

In some embodiments, the one or more processors **128** may provide one or more websites to the user for evaluation of multiple oblique images to provide the footprint of the roof. For example, the user and/or the processors **128** may identify edges of the roof. Two-dimensional and/or three-dimensional information regarding the edges (e.g., position, orientation, and/or length) may be obtained from the images. Using the two-dimensional and/or three-dimensional information (e.g., position orientation, and/or length), line segments may be determined with multiple line segments forming at least a portion of the footprint of the roof.

The footprint may provide a two-dimensional boundary and/or outline of the roof. In a step **194**, a predominant pitch value for the roof may be determined. In some embodiments, a predominant pitch value may be determined using the footprint as a boundary of the roof. The predominant pitch may be a weighted average of individual pitch factors for two or more portions of the roof. FIG. **7** illustrates an exemplary slope factor chart for determining pitch factors. For example, a first portion of the roof (e.g., 60% of the roof) may be at a 6:12 pitch. The 6:12 pitch corresponds to 1.1180 as the pitch factor). A second portion of the roof (e.g. 40% of the roof) may be at a 4:12 pitch. The 4:12 pitch corresponds to 1.0541 as the pitch factor. Thus, the weighted value of the first portion of the roof having 6:12 pitch is:

(Pitch Factor)*(Percentage of roof)=First Weighted Value

1.1180*0.6=0.6708 EQ. 1

The weighted value of the second portion of the roof having 4:12 pitch is:

(Pitch Factor)*(Percentage of roof)=Second Weighted Value

1.0541*0.4=0.42164 EQ. 2

The sum of 0.6708 and 0.42164 is 1.09244 as the total weighted pitch value. A total weighted pitch value of 1.09244 is closest to a pitch factor of 1.0833 in the table in FIG. **7**. This pitch factor corresponds to a 5:12 pitch. As such, the predominant pitch in this scenario would be 5:12. Using the predominant pitch and outer dimensions provided by the footprint, an estimated area of the roof may be determined, in a step **196**.

In some embodiments, the user may review and reevaluate the estimated area of the roof obtained. For example, using the system and methods described herein, the user may review the steps for obtaining the footprint, the predominant pitch value, and/or estimated area. Additionally, the user may provide for a review report. The review report may comprise feedback to the one or more processors **128** regarding errors, concerns, and/or the like.

Referring to FIGS. **1**, **6** and **8**, in a step **184** and **186**, a customer and/or contractor may receive a roof report **200**. FIG. **8** illustrates an exemplary embodiment of a roof report **200** provided in accordance with the present disclosure. The program logic **139** may provide for one or more user terminals **104** interfacing with the processor **108** over the network **106** to provide one or more roofing report website pages allowing customers and/or contractors to view the roof report **200**.

Generally, roofing reports within the industry are detailed with data sets regarding pitch, total area, eave length, hip ridge length, valley length, number of box vents, and the like. The roof report **200** may be streamlined to generally include data sets such as customer information **202**, roofing **204**, estimated area detail **206**, and contractor(s) **208**. The customer information data set **202** may include the customer name, customer contact information, and the like. The roofing data set **204** may include one or more nadir images of the roof and one or more oblique images of the roof. The estimated area detail **206** may provide the total estimated roof area as

determined using the second host system **126** described herein. The contractor data set **208** may include one or more contractor names and associated contractor contact information for the one or more contractor names.

The roof report **200** may be distributed using the first host system **102** and/or the second host system **126** to the one or more user terminals **104**. For example, the roof report **200** may be distributed using the first host system **102** to a contractor at a first user terminal **104** and the roof report **200** may be distributed using the first host system **102** to the customer at a second user terminal **104**.

In some embodiments, the first host system **102** and/or the second host system **126** may distribute the roof report **200** to one or more recipients in addition to, or in lieu of, the customer. For example, the roof report **200** may be distributed to recipients including, but not limited to, roof material suppliers (e.g., small roofing companies, Lowes, Home Depot, and the like), insurance companies, real estate agencies, home services and/or cleaning companies, insulation companies, auditing companies, and/or contractors. Contractors and/or suppliers may be associated with residential and/or commercial building elements and/or services including, but not limited to, fireplaces, pool sales, fencing, lawn maintenance, gardening, pavement resurfacing, decking, sunrooms, roofing, guttering, custom Christmas light designs, siding, windows, doors, garage doors, and the like.

In some embodiments, additional data sets may be included within the roof report **200**. For example, data sets may include, but are not limited to, weather data, insurance/valuation data, census data, school district data, real estate data, and the like.

Weather data sets may be provided by one or more databases storing information associated with weather (e.g., inclement weather). A weather data set within the roof report **200** may include, but is not limited to, hail history information and/or location, wind data, severe thunderstorm data, hurricane data, tornado data, and/or the like. In some embodiments, the one or more databases providing weather information may be hosted by a separate system (e.g., LiveHailMap.com) and provide information to the first host system **102** and/or the second host system **126**. The weather data set may be included within the roof report **200** and provided to the customer and/or other parties. In some embodiments, weather data sets may be provided within a report as described herein without the addition of roof related information (e.g., roofing data set **204**).

Insurance and/or valuation data sets may be provided by one or more databases storing information associated with housing insurance and/or valuation. An insurance and/or valuation data set may include, but is not limited to, insured value of the home, insurance premium amount, type of residence (e.g., multi-family, single family), number of floors (e.g., multi-floor, single-floor), building type, and/or the like. In some embodiments, the one or more databases may be hosted by a separate system (e.g., Bluebook, MSB, 360Value) and provide information to the first host system **102** and/or the second host system **126**.

The insurance and/or valuation data set may be included within the roof report **200** and provided to the customer and/or other parties. For example, during underwriting of a home, an insurance company may be able to request the roof report **200** on a home that is recently purchased. The information within the roof report **200** may be integrated with insurance information provided by an insurance database and used to form a quote report. The quote report may be sent to the customer and/or insurance company. Alternatively, the roof report **200** may be solely sent to the insurance company with the insurance company using the information to formulate a quote.

In another example, the roof report **200** may be used in an insurance claim. In the case of a catastrophe of a customer, one or more databases may be used to provide an insurance dataset with claim information in the roof report **200**. For example, an insurance database having a policy in force (PIF) and a weather database may be used to correlate information regarding an insurance claim for a particular roof. This information may be provided within the roof report **200**.

Real estate and/or census data sets may also be including within the roof report. The real estate and/or census data sets may be provided by one or more databases having detailed information of a home. For example, a real estate data set may include, but is not limited to, the homeowner's name, the purchase price of the home, number of times the home has been on the market, the number of days the home has been on the market, the lot size, and/or the like. The census data set may include information concerning the number of residents within the home. In some embodiments, the one or more databases may be hosted by a separate system (e.g., Core Logic) and provide information to the first host system **102** and/or the second host system **126** to provide data sets as described herein. The real estate data set may be included within the roof report **200** and provided to the customer and/or other parties.

The roof reports **200** may include roofing data as described herein; however, system **100** may be used to provide other information to a customer and/or other party without roof related information (e.g., roofing data set **204**). For example, in a real estate transaction, one or more databases in host system **102** and/or host system **126** may include recent home sales over time in one or more geographic areas. The footprint of each home and home valuation may be provided in one or more databases within host system **102** and/or host system **126**. Using the systems and methods described herein, a customer (e.g., homeowner) may request a report determining approximate sales price of a home using the footprint and/or valuation versus comparables within the geographic area. The report may provide an approximate sale price of the home. In some embodiments, demographics of the homeowners may be used and stored in one or more databases. The demographic information may be used for potential advertising and/or comparables within the geographic area. In another example, using systems and methods as described herein, a report may be provided for housecleaning and/or home services area (e.g., fireplace cleaning, pool sales, fencing, lawn maintenance/gardening, pavement resurfacing, decking, sunrooms, roofing, guttering, custom Christmas light designs, siding, windows, doors, garage doors, and the like). For example, using a footprint of a home, number of stories within a home, and the like, a determination of average square footage within a home may be determined. This information may be used to formulate a price quote for cleaning services.

Other services related to roofing may be provided within the roof report **200**. For example, using the square footage of the roofing footprint, a price quote may be generated on the cost of insulation for the roof (e.g., energy efficiency, insulation replacement, and the like). Additionally, audits may be performed using information within one or more databases. For example, using the roofing area of a home, historically paid insurance claims for comparables, and validation of payment for a specific claim for the home, a comparison may be made to determine whether the service payment for the

specific claim was within a certain threshold. Auditing, it should be understood, may be applied to other areas as described herein as well.

Although the terms "home" and "house" are used herein, it should be noted that the systems and methods in the present disclosure may be applied to any residential and/or commercial building or structure.

From the above description, it is clear that the inventive concept(s) disclosed herein is well adapted to carry out the objects and to attain the advantages mentioned herein as well as those inherent in the inventive concept(s) disclosed herein. While presently preferred embodiments of the inventive concept(s) disclosed herein have been described for purposed of this disclosure, it will be understood that numerous changes may be made which will readily suggest themselves to those skilled in the art and which are accomplished within the scope and spirit of the inventive concept(s) disclosed herein and defined by the appended claims.

What is claimed is:

1. One or more non-transitory computer readable medium storing a set of computer executable instructions for running on one or more computer systems that when executed cause the one or more computer systems to: identify a geographic location of a roof; determine a footprint and predominant pitch of the roof by analyzing one or more image showing the roof; determine an estimated roofing area of the roof based on the predominant pitch and the footprint of the roof; and generate a roof report for determination of an amount of materials needed for a construction project, wherein the roof report includes at least one image showing the roof and the estimated roofing area of the roof.

2. The one or more non-transitory computer readable medium storing a set of computer executable instructions for running on one or more computer systems of claim **1**, that when executed further cause the one or more computer systems to determine contact information of one or more contractors within a region of interest of the geographic location of the roof, and to provide a roof report, wherein the roof report includes one or more ortho images of the roof, one or more oblique images of the roof, the estimated roofing area and the contact information of one or more contractor within the region of interest of the geographic location of the roof.

3. The one or more non-transitory computer readable medium of claim **2**, wherein the roof report includes contact information of the customer.

4. The one or more non-transitory computer readable medium of claim **1**, wherein the one or more non-transitory computer readable medium comprises a first non-transitory computer readable medium of a first host system and a second non-transitory computer readable medium of a second host system.

5. The one or more non-transitory computer readable medium of claim **1**, wherein identifying the geographic location of the roof further comprises obtaining contact information of a customer.

6. The one or more non-transitory computer readable medium storing a set of computer executable instructions for running on one or more computer systems of claim **1**, that when executed further cause the one or more computer systems to receive customer input to validate geographic location of the roof.

7. The one or more non-transitory computer readable medium of claim **6**, wherein the geographic location includes coordinates and validation of the geographic location includes instructions for receiving customer input to alter one or more coordinates of the geographic location.

8. The one or more non-transitory computer readable medium of claim **1**, wherein identifying a geographic location of the roof includes identifying one or more edges of the roof in an image.

9. The one or more non-transitory computer readable medium storing a set of computer executable instructions for running on one or more computer systems of claim **1**, that when executed further cause the one or more computer systems to identify edges of the roof; determine three-dimensional information of the edges including position, orientation and length using multiple oblique images from multiple cardinal directions; and, determine, automatically, one or more line segments forming a portion of a footprint of the roof utilizing position and orientation of the edges.

10. The one or more non-transitory computer readable medium of claim **1**, wherein determining the predominant pitch includes determining a plurality of pitch values with each pitch value associated with a portion of the roof, the predominant pitch based on the plurality of pitch values.

11. The one or more non-transitory computer readable medium of claim **10**, wherein each pitch value is associated with an estimated percentage of roof area to provide an average pitch value.

12. The one or more non-transitory computer readable medium storing a set of computer executable instructions for running on one or more computer systems of claim **1**, that when executed further cause the one or more computer systems to provide the roof report to one or more contractors, the contractor located within the region of interest of the geographic location of the roof.

13. A system, comprising:

two or more host systems, each host system having one or more non-transitory computer readable medium;

the non-transitory computer readable medium of the first host system storing a set of computer executable instructions that when executed by one or more processors causes the one or more processors to:

identify a geographic location of a roof;

determine contact information of at least one contractor within a region of interest about the geographic location of the roof;

the non-transitory computer readable medium of the second host system storing a set of computer executable instructions that when executed by one or more processors causes the one or more processors to:

determine a footprint and predominant pitch of the roof by analyzing one or more image showing the roof;

determine an estimated roofing area based on the predominant pitch and the footprint of the roof; and,

generate a roof report for determination of an amount of materials needed for a construction project, wherein the roof report includes one or more ortho images of the roof, one or more oblique images of the roof, the estimated roofing area and contact information of one or more contractors within the region of interest.

14. A roofing estimate method, comprising:

receiving, by at least one computer processor from a user via a user terminal, a geographic location of a roof;

providing to the user, with the computer processor, imagery of the roof based on the geographic location of the roof;

determining and providing, with the computer processor, an estimated roofing area based at least on a predominant pitch and a footprint of the roof by analyzing one or more image showing the roof, the footprint of the roof determined at least in part using at least one image of the roof; and

generating, with the computer processor, a roof report for determination of an amount of materials needed for a construction project, wherein the roof report includes at least one image showing the roof and the estimated roofing area of the roof.

15. The roofing estimate method of claim **14**,

wherein the roof report further includes contact information of one or more contractor within a region of interest of the geographic location of the roof.

16. The roofing estimate method of claim **14**, wherein the footprint of the roof is determined at least in part with oblique images of the roof.

17. The roofing estimate method of claim **14**, wherein the predominant pitch value of the roof based at least in part on the footprint of the roof as a boundary of the roof.

18. The roofing estimate method of claim **14**, wherein the predominant pitch is based on a weighted average of individual pitch factors for two or more portions of the roof.

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